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**EXTENDED ABSTRACTS**



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## LATE CRETACEOUS-EARLY PALEOCENE OSTEICHTHYANS FROM THE FONTLLONGA SECTION (SOUTH-CENTRAL PYRENEES, SPAIN): NEW RECORD AND IMPLICATIONS

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### INTRODUCTION

During the last decade, a group of geologists and paleontologists have extensively studied diverse localities of the Tremp Basin (South-Central Pyrenees) that range in age from late Campanian to Danian (ÁLVAREZ-SIERRA *et al.* 1994; LÓPEZ-MARTÍNEZ *et al.* 1998, 1999, 2001). The main objective of the project is the study of the patterns of extinction and palaeoenvironmental changes around the Cretaceous/Tertiary boundary.

The Tremp Basin is tectonically broken into two major structures, the Tremp and Ager synclines, which are separated by the Montsec thrust. This present-day disposition reflects the former configuration of an elongated remnant basin deepening westward to the Atlantic Ocean, filled with basinal turbidites, shelf-deltaic deposits, and continental red beds. The Tremp Formation, which represents the last filling episode of the Pyrenean remnant basin, preserves the geological record across the K/T boundary in continental environments, which allows a proper approach to the study of the biotic and abiotic events around the K/T crisis. The red beds of the Tremp Formation are rich in fossil remains from shallow marine, coastal, and non-marine environments: cyanobacterial formations (oncolites and stromatolites), benthic foraminifera, rudists, plants, fishes, dinosaurs, crocodiles, turtles, and mammals.

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# **ICHTHYOFAUNA**

At least seven localities with fish remains have been located in the Tremp-Graus Basin: Fontllonga 6 and Figuerola 2 (early Maastrichtian, Ager Syncline), Fontllonga 3 and Figuerola 1 (early Danian, Ager Syncline), Orcau and Suterranya (late Campanian, Tremp syncline), and Julí (Maastrichtian, Tremp syncline). Fontllonga 6 and Fontllonga 3, located in unit 2 of the Fontllonga Section, in the Tremp Fm., present the richest fish record. Chondrichthyans (mostly rays: *Igdabatis indicus* and *Rhombodus* sp.) are dominant in Fontllonga 6, whereas osteichthyans are abundant in Fontllonga 3. Previous studies of the material from Fontllonga focused mainly in the chondrichthyan assemblage, and have provided important palaeoenvironmental and palaeogeographic data (ÁLVAREZ-SIERRA *et al.* 1994; SOLER-GIJÓN & de la PEÑA 1995; SOLER-GIJÓN & LÓPEZ-MARTÍNEZ 1995, 1998; KRIWET *et al.* 2000). A complete and detailed description of the chondrichthyan assemblages from Fontllonga 6 and other Cretaceous localities such as Orcau, Suterranya, and Julí, is currently in progress.

The osteichthyans from the Fontllonga Section have been less extensively studied than the chondrichthyans. However, preliminary studies have shown relevant results concerning diverse aspects of morphology, palaeobiology, and palaeoenvironment, some of them directly related with the K/T events (de la PEÑA & SOLER-GIJÓN 1996, de la PEÑA 1997, IGLESIAS-MARTÍN & SOLER-GIJÓN 1999).

Fontllonga 3 presents the richest osteichthyan assemblage. It is located at the top of chron C29r (early Danian; LÓPEZ-MARTÍNEZ *et al.* 1999), less than 0.1 m.y. after the K/T crisis. This locality is interpreted as a clay-plug of an abandoned ox-bow of deltaic channel deposits with marine influence.

Fontllonga 6 is situated near the base of the chron C31r (Early Maastrichtian) and represents an upper estuarine deposit.

The objectives of the present work are:

- 1) to update the current record of fossil osteichthyans in the localities of Fontllonga 6 and 3, around the K/T boundary, and
- 2) to discuss the possible implications of the new findings and data-tions of certain localities, especially Fontllonga 3.

## **PRELIMINARY RESULTS**

The vertebrate remains were unearthed by bulk sampling and screen washing of large amounts of marls and clays (more than 800kg.; ÁLVAREZ-SIERRA *et al.* 1994). The material is housed in the Departamento

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de Paleontología, Universidad Complutense, Madrid. Following is a list of osteichthyan taxa found in the Fontllonga localities.

From Fontllonga 6, Lepisosteidae indet. have been recorded.

From Fontllonga 3, the following taxa have been recorded:

- Lepisosteidae indet. (IGLESIAS MARTÍN & SOLER-GIJÓN 1999)
- *Ocloedus* sp. (formerly *Coelodus*)
- Pycnodontiformes indet., previously referred to *Stephanodus* (ÁLVAREZ-SIERRA *et al.* 1994, SOLER-GIJÓN & DE LA PEÑA 1995, de la PEÑA & SOLER-GIJÓN 1996, de la PEÑA 1997)
- Osteoglossidae indet., and
- Siluriformes indet. (de la PEÑA & SOLER-GIJÓN 1996).

**CONCLUDING REMARKS**

The study of the spatio-temporal distribution of freshwater osteichthyan taxa, such as osteoglossids, is a powerful tool for the analysis of the plate tectonic reconstructions. The new information provided by the Pyrenean osteichthyan assemblage can be relevant for the study of the palaeogeographic relationships among Eurasia, Africa, and India close to the K/T boundary, testing the palaeogeographic interpretations already suggested based on chondrichthyans (SOLER-GIJÓN & LÓPEZ-MARTÍNEZ 1995, 1998).

As recently indicated by CAVIN (2001) the quality of the fossil record of osteichthyans in the Danian is rather bad, with a simple completeness metric (SCM) of 36.7%, in comparison with the Campanian and Maastrichtian (SCM= 70 and 66%, respectively). Consequently, the detailed study of early Danian from Fontllonga 3, and the comparison with other rich bony fish assemblages of late Maastrichtian and early Paleocene localities (e.g., Nagpur, India, and localities of El Molino Fm, Bolivia) are vital for a more complete understanding of the extinction pattern of osteichthyans at the K/T boundary.

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